FAX

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Date : February 6, 2001

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From : William J. Crossetta, Jr.

Page : 11 (including cover)

Subject :
Patent Application

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URGENT URGENT URGENT

Dear Howard:

Enclosed are re-written pages 16-21 of the specification and the five Figures that will be included in the patent.

Note, the figures are not finalized and contain my corrections and numbering for the draftsman to finish. He should have them finalized in a couple of days.

Please complete your review and call me.

CONFIDENTIALITY NOTE

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FIG 4 is a perspective view of an antenna of FIG 3 illustrating attachment to the underside of a vehicle.

FIG 5 is a diagrammatic illustration of the GPS device and system of the invention.

DETAILED DESCRIPTION OF THE DRAWINGS

At the outset, it should be clearly understood that like reference numerals are intended to identify the same structural elements, portions or surfaces consistently throughout the several drawing figures as such elements, portions or surfaces may be further described or explained by the entire written specification, of which this detailed description is an integral part. Unless otherwise indicated, the drawings are intended to be read together with the specification, and are to be considered a portion of the entire written description of this invention.

One embodiment of the antenna of the invention is illustrated in FIG 1. Therein, antenna 10 is shown in exploded perspective as comprising stacked metal positive plate 12, ceramic separation plate 13 and metal ground plate 14. In this embodiment, a high dielectric electronic circuit board 11 comprising integrated signal enhancing electronic circuitry and having dual conductive antenna wire 19 extending therefrom, is mounted to a metal shield base plate 15, the exposed electronic surface being surrounded by shroud 16, with the stacked antenna plates being mounted through ground plate 14 to the exterior surface of shield base. Metal pin 17 has

a dual function in that it connects positive plate 12 to the plus side of the electronic circuitry, while also fixing the components of the antenna in relative mounted position. Ceramic separation plate 13, is significantly thicker than the positive and ground plates and comprises hole 13a extending therethrough sized in diameter to allow pin 17 to pass therethrough in a tight fit. Ground plate 14 is thin and comprises hole 14a, while base shield plate 15 comprises hole 15a, both holes being sized greater in diameter than hole 13a and having sufficient diameter to surround but not engage pin 17. Positive plate 12 is thin and comprises a hole 12a, sufficient to allow pin 17 to pass tightly therethrough. The ground and positive plates are mounted to opposite surfaces of the ceramic separator plate, with their holes aligned with the hole in the ceramic separator plate, such that when pin 17 is soldered at one end to the exposed face of positive plate 12 and is passed through the ceramic separator and ground plate, since the hole in the ground plate is of larger diameter than the hole in the ceramic separator, the pin does not engage the ground plate.

Shield base plate 15, comprises a hole 15a which is also greater in diameter than the hole of the ceramic separator plate such that when pin 17 passes through shield base plate 15 into electronics board 11, it does so without engaging shield base plate 15. Fixed soldered engagement of metal pin 17 with circuitry in the dielectric electronics board forms an uninterrupted positive side circuit from the face of the positive plate to the positive

side of the electronics circuit board, and fixes the stacked plates in position on the shield base plate. Shroud 16, is configured to surround the otherwise exposed surface of electronics board 11 without engaging the electronic circuitry and comprises an opening for dual conductor antenna wires 19 to exit from positive and negative connection to the electronics board and/or shield base plate, to the GPS processor.

In the preferred embodiment illustrated in FIG 1, a cured hardened resin mixture 18 is illustrated as surrounding the stacked plates, including the shield base plate and shroud, by phantom lines representing the exterior margin of the resin, containing therein random particles of magnesium carbonate powder 20, mixed therein. In a preferred embodiment, the resin mixture comprises polyester resin and styrene monomer, with talc, magnesium carbonate powder and sodium borosillicate microspheres mixed therein.

FIGS 2 and 3 illustrate a preferred antenna assembly having particular utility for mounting to the underside of a mobile vehicle. Therein antenna 30, generally comprising the antenna illustrated in FIG 1, the exterior margins of thereof being shown as a generally rectilinear molded resin unit, having a dual conductor antenna wire 31 extending therefrom for connection to a GPS processor. Bracket 32 is illustrated as being "L" shaped and formed from aluminum, having a ceramic magnet 35 mounted on the exterior surface of long leg 32a by means of rivets 33. Antenna 30 is mounted to the exterior surface of short leg 32b, in this

preferred embodiment by means of non-conductive epoxy 34. Margin 30a of antenna 30 is the margin that the outward face of the positive plate of the antenna faces toward, the ground plate of the antenna facing toward the surface of the short leg. This arrangement of the antenna on an aluminum bracket appears to even further increase the efficiency of the antenna.

FIG 3, particularly illustrates the relationship of the components of antenna 30 in their mounted arrangement. Therein, the assembled relationship of pin 47 fixing the position of metal positive plate 42, ceramic separation plate 43, metal ground plate 44, metal shield base plate 45 and electronic board 41 is illustrated, with shroud 46 covering the exposed electronic circuitry and cured resin mixture 48, containing random magnesium carbonate particles 49, surrounding the components in a preferred embodiment wherein the depth "d" of mixture from the face of positive plate 42 to the adjacent antenna margin 30a is greater than the depth "d-x" from the face of ground plate 44 to the adjacent antenna margin 30b, and non-conductive epoxy 34, spacing antenna 30 from engaging short leg 32b.

FIG 4 illustrates a preferred mounting arrangement of the antenna arrangement of FIG 3. Therein is illustrated the metal underside 50 of about the trunk area of an automobile, wherein antenna 30 of the mounting arrangement of FIGS 2-3, is magnetically mounted to the underside, such that the face of the ground plate is oriented to face horizontally about toward the side margin 50a of

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the automobile thus facing a lesser proportion of the undersurface of the automobile than the ground plate. In this particular embodiment, the GPS processer and wireless communication means are combined in housing 51, with self contained communication antenna 52. GPS antenna 30 is connected by antenna wire 31 to the GPS processer. Housing 51 comprises magnetic means or the like for convenient detachable mounting to the vehicle. Margin 50a of the vehicle is illustrated as a metal surface extending downwardly from the undersurface of the automobile, to illustrate placement of the antenna on a vehicle without direct line-of-sight view to orbiting satellites.

FIG 5 is a diagrammatic illustration of a portable GPS device incorporated in a system of the invention. Therein GPS processor unit 60 is illustrated as mounted together with first wireless cellular/satellite communications means 61 in a common assembly, connected by wire harness 62, the GPS processor being enabled to receive on/off and/or tuner sensing instructions through the wire harness from communication means 61 and transmit positional data to communication means 61 for wireless retransmission to a remote address. The common assembly is arranged in a housing comprising a ceramic magnet or the like mounted on an exterior surface having sufficient strength to magnetically mount the housing to a metal underside of a vehicle, with the wireless communication having an exposed communications antenna 67 for wireless communication with a remote address. Processor unit 60 is connected by antenna wire

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63 to GPS antenna 64, and is enabled to receive signals from the GPS antenna in accord with electromagnetic signals received by the GPS antenna from orbiting satellites 65 and 66. Orbiting satellite 68 and/or cellular receiving means 69 is enabled to receive and send electromagnetic radio signals to and from first communication means 61 in accord with signals received and sent from a remote communication means 70. Remote communication means 70 is illustrated as linked to a user operated computer 71 enabled to receive positional data communicated from said first communication means 61 to said remote communication means 70, and generally comprises software which provides a visual display of location generally superimposed on a geographic area map for the convenient positional orientation of the viewer. In addition, such software generally enables the user to direct actions to be taken including turning on/off the GPS processor and/or first communication means and/or changing communication parameters and the like.

While the best known modes of this invention have been shown herein, applicant does not intend to be limited to the particular details described and illustrated and it is understood the embodiments and details can be altered by one skilled in the art.

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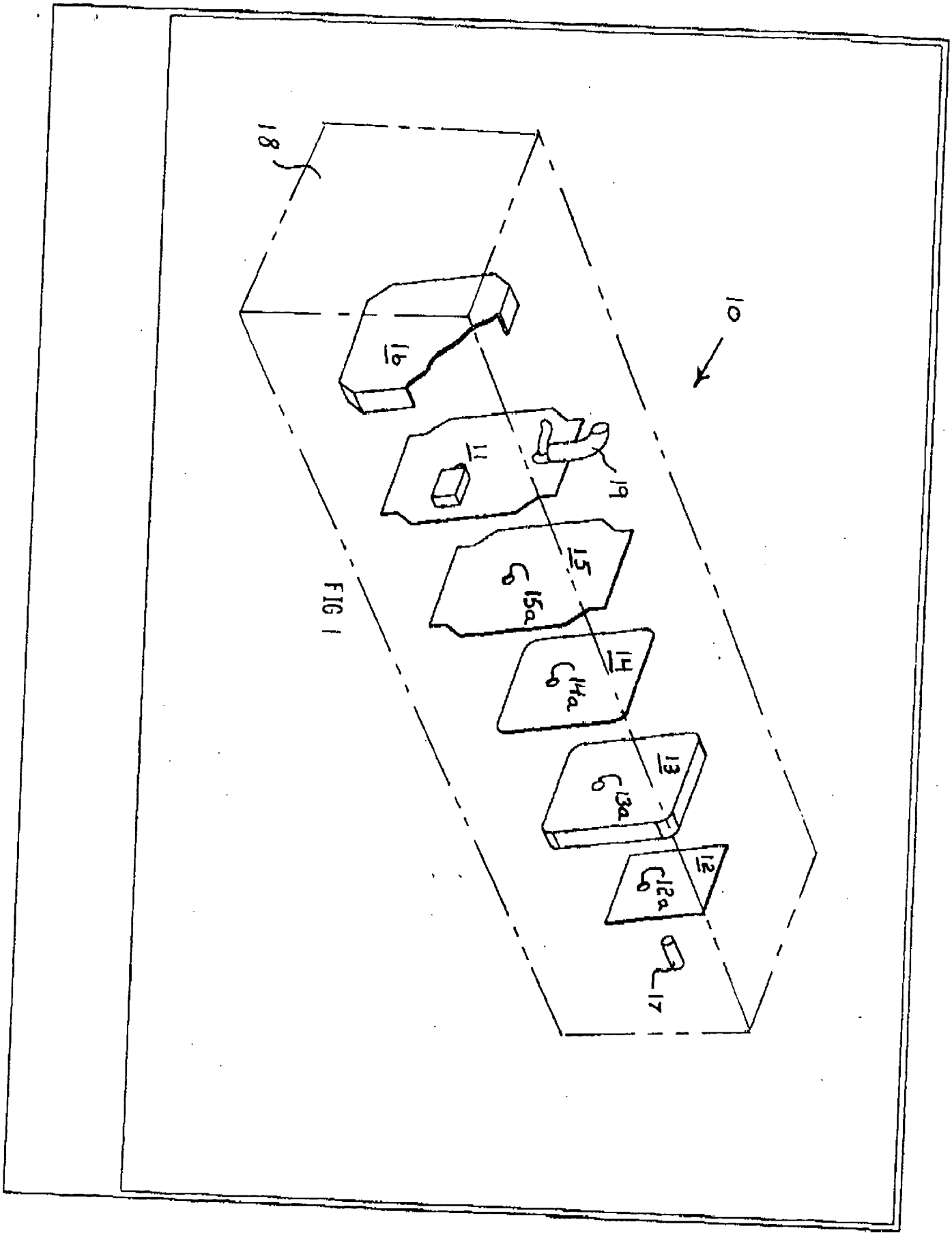

FIG 1

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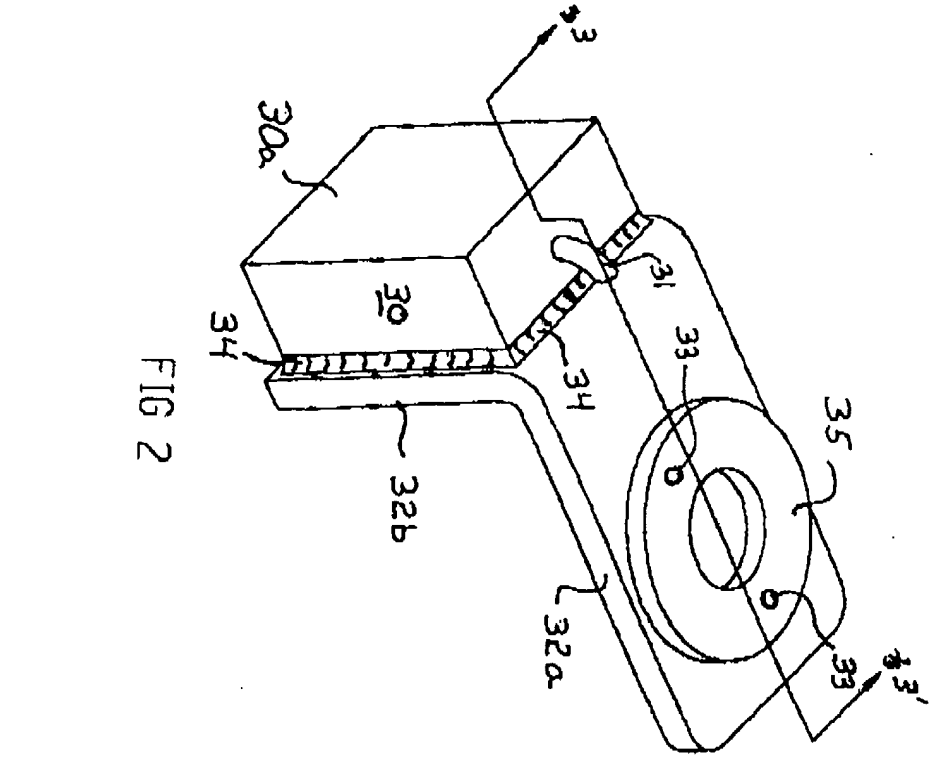

FIG 2

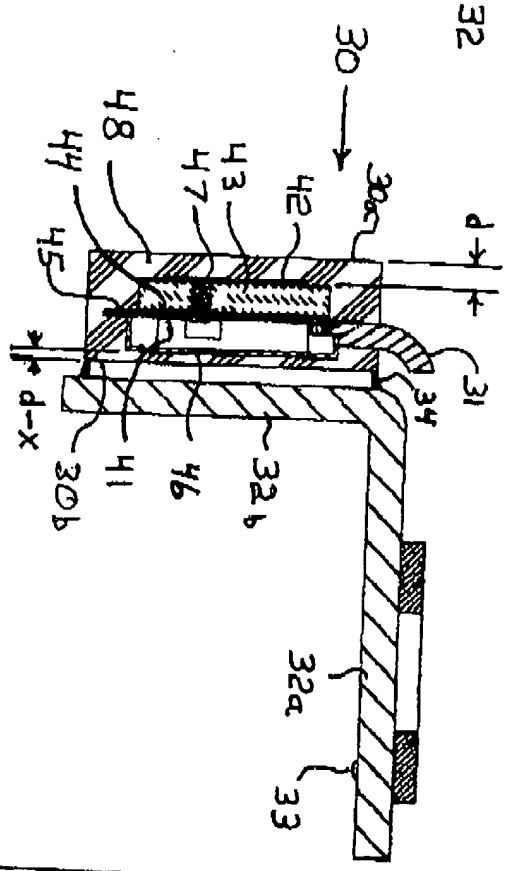

FIG 3

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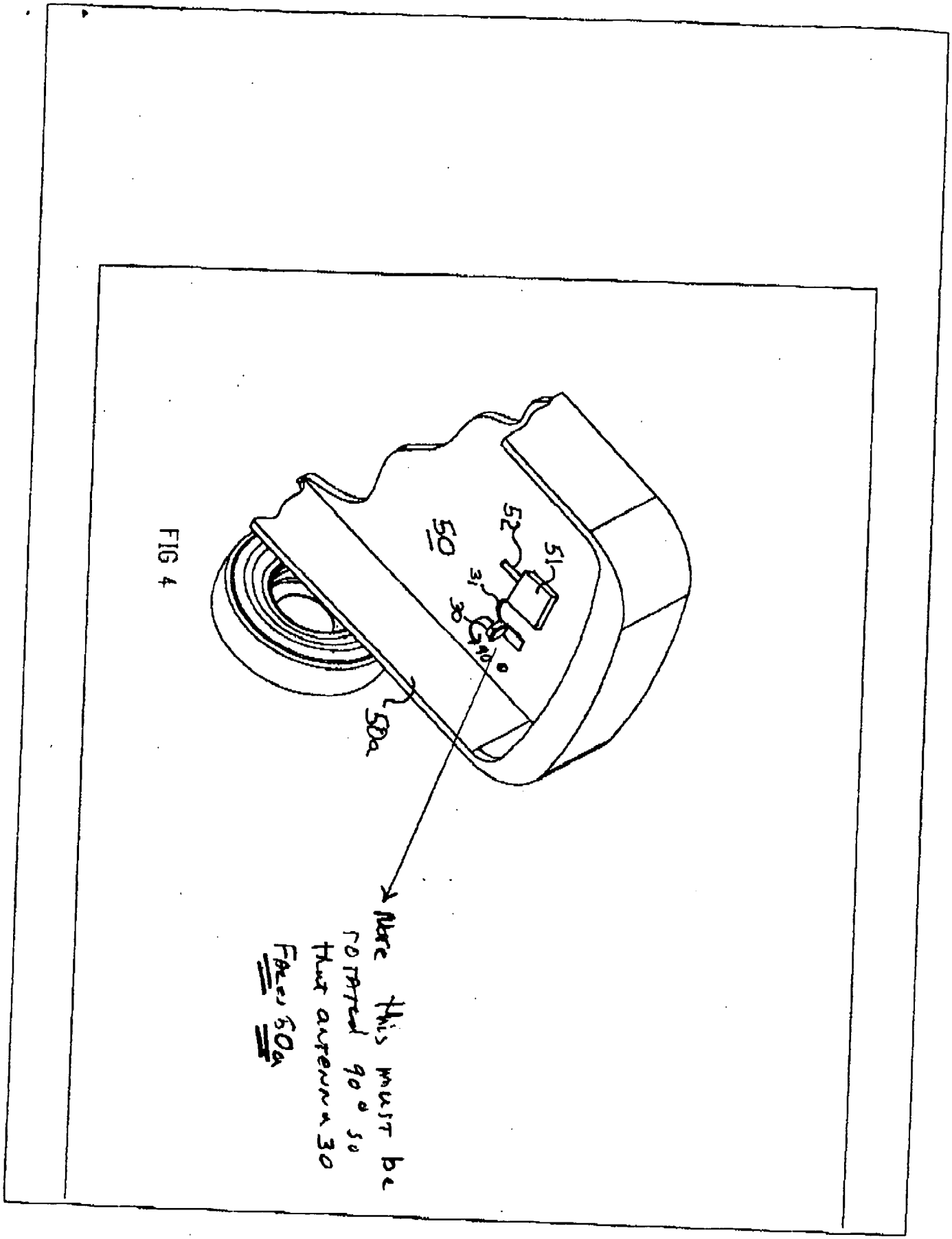

FIG 4

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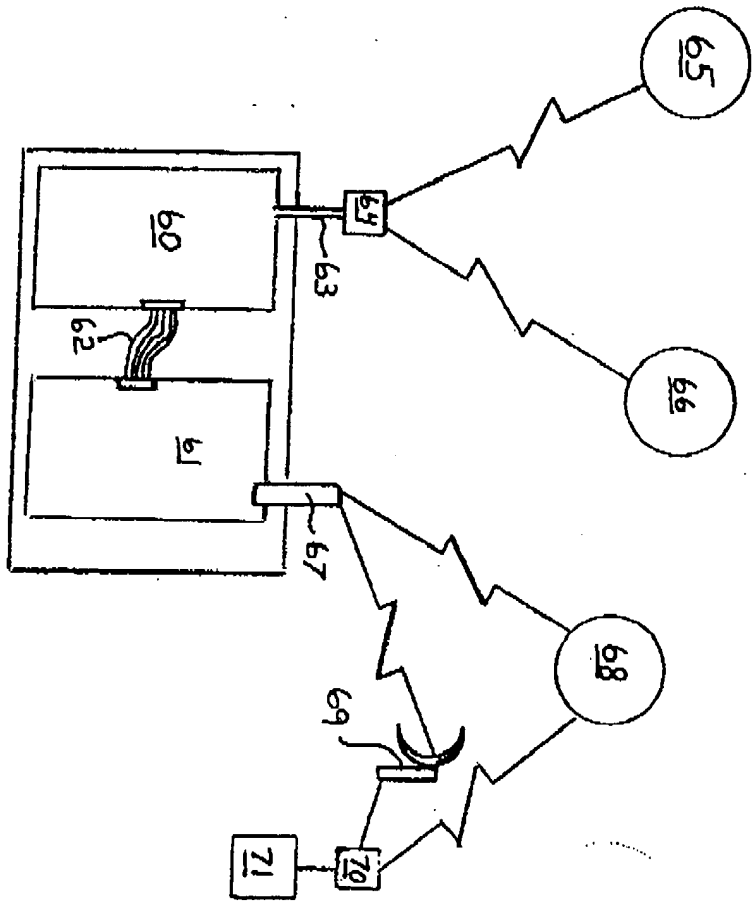

FIG 5